
Human iPSC-derived micro-heart muscles for high-throughput cardiac drug discovery

Grant Award Details

Human iPSC-derived micro-heart muscles for high-throughput cardiac drug discovery

Grant Type: Tool Translational Research Projects

Grant Number: TRAN4-13022

Project Objective: To develop a high throughput screening system using human induced cardiomyocyte microtissues cultured upon custom made force transducing plates. The system will be available to users via a contract service provided by Organos.

Investigator:

Name: Samuel Wall

Institution: Organos Inc.

Type: PI

Disease Focus: Heart Disease

Human Stem Cell Use: iPS Cell

Award Value: \$1,119,382

Status: Active

Grant Application Details

Application Title: Human iPSC-derived micro-heart muscles for high-throughput cardiac drug discovery

Public Abstract:**Translational Candidate**

In vitro miniaturized array of heart muscle amenable for use in efficient high-throughput drug discovery and screening campaigns.

Area of Impact

Effective high-throughput screening of drugs on human heart muscles does not exist, hindering the discovery of therapeutics to treat heart failure.

Mechanism of Action

Current approaches for drug discovery often miss a vast majority of druggable targets. Our approach for high throughput screening will provide a new platform for the more efficient drug discovery in human heart muscles exhibiting physiological features and drug responses, which cannot be achieved in 2D cardiac preparations. The proposed tool can be used in large-scale screening campaigns for de novo cardiovascular drug discovery or drug repurposing, at a reduced cost.

Unmet Medical Need

Innovation in heart failure therapeutics is lacking, despite the severity of the disease. Current pharmacologic approaches are suboptimal, thus mortality associated to heart failure remains high. Developing a tool for high-throughput drug discovery will lead to improved pharmacologic treatments.

Project Objective

High-throughput drug discovery and screening tool.

Major Proposed Activities

- Fabrication of the high-throughput screening tool to identify drugs to treat heart disease
- Validate the heart muscle platform with an FDA-approved compound library
- Test healthy and diseased population variability in drug effect on cardiac contractility

Statement of Benefit to California:

Although heart disease is the leading cause of death in California, decades-old drugs are still mainstays of therapy, despite causing arrhythmia and hypotension. The speedy development of treatments for heart disease is hindered by poorly predictive cardiac heart tissue models. Our tool enables high throughput testing of compounds on heart function for faster and more effective identification of new drugs to treat heart disease, an enormous benefit for the healthcare of Californians.

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